Summary of Revisions to SP-F8 Technical Report

This document summarizes the revisions that have been made to the SP-F8 report, Transfer of Energy and Nutrients by Anadromous Salmonid Migrations. All of the revisions were made in response to comments and suggestions received during a presentation of the study results to the Fisheries EWG on May 21st. The changes are listed in the table below by page number of the original and revised drafts. Each change is described, the reason for the change is given and its significance is discussed.

Page Number		Description of Changes
Old	New	
4-5	4-5	The equation for extrapolating the estimates of salmonid escapement for the surveyed stream reaches to the stream reaches within each inundation zone was changed. The old equation extrapolated the total escapement of the surveyed stream reaches based on the relative total lengths of the surveyed and inundation zone stream reaches. The new equation individually extrapolates the escapement estimate for each tributary. It extrapolates the estimate for each surveyed reach to the reach of that tributary within each inundation zone based on the relative lengths of the tributary reach surveyed and the tributary reach within the inundation zone. For the North Fork Feather River and other tributaries for which surveys were not conducted, the estimates were derived from those of the surveyed tributaries. This change in methodology was made because flow data for individual tributaries, rather than total inflow, was used to compute nutrient concentrations as described below for the page 5-9 and 5-10 changes. The new method for extrapolating the results of the surveys to the inundation zone stream reaches probably improves the precision of the inundation zone escapement estimates.
5-5	5-5	Table 5.2-3 shows the changes in the escapement estimates for the three inundation zones resulting from the change in the equation on page 4-5 (see above). The new estimates are lower for Zone 1 and substantially higher for Zones 2 and 3 than the old estimates. As indicated above, the new estimates are probably more precise than the old estimates.
5-7	5-7	The mean weight estimate for Feather River spring-run Chinook salmon adults was reduced from 30 pounds to about 17 pounds. This change was made in response to comments at the EWG meeting that the 30-pound estimate is much too high. The new estimate was derived from measured lengths of Chinook salmon returns at the Feather River Hatchery in fall 1999 through winter 2001 and a length-weight regression equation for Chinook salmon. It was not possible to distinguish between spring-run and fall-run Chinook lengths, but there seems to be no evidence that the two runs differ substantially in size in the Feather River.

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5-8	5-8	Table 5.3-2 shows large changes in the estimates of escapement biomass and of annual loadings of nutrients. The new biomass escapement estimates for the surveyed reaches are much lower than the old estimates simply because of the reduction in the mean weight estimate for Chinook salmon (see above). The escapement biomass estimates for Zone 1 are especially reduced because of the lower mean weight estimate and the reduction in the escapement numbers for Zone 1, as noted above for page 5-5. The escapement biomass estimates for Zones 2 and 3 are only modestly lower than the original estimates because the reduction in mean weight of the fish is largely compensated by an increase in the estimates for escapement numbers (see changes on page 5-5). The changes in estimates for loading of nutrients and energy parallel those for biomass escapement because the loading estimates are directly related to the biomass estimates. The reductions in the Zone 1 estimates are large enough to be significant, but because of other uncertainties in the estimates (see page 6-1, Conclusions), their significance cannot be reliably determined.
5-9	5-9 & 5-10	The method for converting the nutrient loadings to estimates of nutrient concentration increases was changed. The change was made because it was learned at the EWG meeting that USGS flow data for each of the major tributaries are available. The method in the original draft used the average August – November total reservoir inflow as the dilution volume, while the new method uses the average August – November flow for each tributary to compute the dilution volume. A new table, Table 5.3-3, has been added to show these flow data. The change in method for estimating the dilution volume is consistent with the changes in the methods used to estimate escapement and loading: the new methods provide tributary specific estimates, while the original methods provided estimates for all tributaries combined. The sum of the tributary-specific dilution volume estimates are used to compute the estimates for nutrient concentration increases in the three inundation zones. The new method greatly reduces bias in the estimates for nutrient concentration increases in Zone 1 because flows of the North Fork and South Fork, which include no Zone 1 stream reaches, are subtracted from the dilution flow volume used to compute the concentrations. As a result, the new estimates for Zone 1, in particular, should be much more accurate than the old estimates.

Page Number		Description of Changes
Old	New	
5-10	5-11	Table 5.3-4 provides the new estimates for nutrient concentration increases in the three inundation zones as determined by the new method described above. The table additionally provides estimates for nutrient concentration increases in the surveyed stream reaches, which could not be estimated using the original method. The new estimates for nutrient concentration increases in the inundation zone are substantially higher than the original estimates, despite the reductions in the loading estimates as noted above for page 5-8. The reason for the increases is that the dilution volumes estimated from the flows of the individual tributaries are much lower than those estimated from total inflow. The revised dilution volumes were computed from tributary flows for years 1970 through 1986, primarily, while the original dilution volume was computed from total reservoir inflow for water years 1995 through 2002. The 1970 through 1986 period includes many relatively dry years, whereas the 1995 through 2002 period was a period of predominantly wet years. As a result of the differences in water years, the dilution volume based on total inflow was almost three times as great as the dilution volumes for Zones 2 and 3 that were based on the sum of the tributary flows. The dilution volume for Zone 1 was only about a fifth of that based on total inflow because flows for the North Fork and South Fork were subtracted from the sums. As noted earlier, the North Fork and South Fork have no Zone 1 stream reaches. Comparisons of the new estimates with results of nutrient concentration measurements in the tributaries remain problematical because of the high detection levels of the analytical methods used for the nutrient concentration measurements.
5-18 & 5-19	5-19 & 5-20	The discussion comparing the phosphorus target levels of the Washington Department of Fish and Wildlife's nutrient enhancement program with the estimates for potential phosphorus concentration increases in the Zone 1 and Zone 2 tributary reaches was modified to reflect the higher values of the new estimates. The new estimates conform more closely to the Washington target levels, although the usefulness of the comparison continues to be hampered by the large range of the estimates and by the fact that the estimates are for concentration increases, while the target levels are for final concentrations. The final paragraph on this page was deleted because the discrepancy discussed was much reduced. Also, the reasons given for the discrepancy have been eliminated as a result of the new method used for estimating the dilution volumes (see Page 5-9 above).
6-1	6-1	The conclusions section was changed to eliminate lack of streamflow data for individual tributaries as a potential source of error in the estimates of nutrient losses due to elimination of anadromous salmonids from the upstream tributaries. Otherwise, the conclusions are the same as in the original draft.